In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Original) A survivor path decoding apparatus for a Viterbi decoder with a constraint length of *K*, comprising:

a best survivor unit for receiving path metrics of 2^{K-2} local winner states from which a best state is selected every *L* iterations_said local winner states are chosen from 2^{K-2} pairs of odd and even states, respectively; and

a survivor memory comprising:

a register-exchange network for receiving decision bits of 2^{K-1} states and generating decision vectors of survivor paths leading to said 2^{K-1} states at instant *i* according to said decision bits of said 2^{K-1} states from instant *i-L* to instant *i*, wherein said 2^{K-1} states are divided into said 2^{K-2} pairs of odd and even states, said decision vectors of said 2^{K-1} states are output every *L* iterations, and each of said decision vectors has a length of *L* bits [[and]]; and

a trace-back unit for storing said decision vectors of said 2^{K-1} states and finding a global survivor path sequence by following said decision vectors back from the best state at instant *i-L*, such that *L* decoded bits are output every *L* iterations.

2. (Original) The apparatus as recited in claim 1 wherein said best survivor unit comprises γ 2-to-1 comparators for choosing the best state among said 2^{K-2} local winner states by comparing said path metrics of said 2^{K-2} local winner states in *L*-1 iterations.

3. (Original) The apparatus as recited in claim 2 wherein the number of said 2-to-1 comparators, γ, is given by:

$$\gamma = \left\lceil \frac{2^{K-2} - 1}{L - 1} \right\rceil$$

where $\lceil \cdot \rceil$ denotes a ceiling function.

4. (Original) The apparatus as recited in claim 1 wherein said number of *L* is equal to a divisible factor of a data payload length for a conformant 802.11g system.

5. (Original) The apparatus as recited in claim 4 wherein said number of *L* is equal to 8 for said conformant 802.11g system.

6. (Original) The apparatus as recited in claim 1 wherein said survivor memory features a decoding window length of $\Gamma = L(L-2) + K - 1$.

7. (Original) A rate 1/*n* Viterbi decoder with a constraint length of *K* comprising:

a branch metric generator for computing a plurality of branch metrics, each of which is a distance between a corresponding branch label and a currently received data symbol including *n* decision metrics;

an add-compare-select module, responsive to said branch metrics, for generating decision bits of 2^{K-1} states along with path metrics of 2^{K-2} local winner states, wherein said 2^{K-2} local winner states are selected from 2^{K-2} pairs of odd and even states, respectively, and said 2^{K-1} states are divided into said 2^{K-2} pairs of odd and even states;

a best survivor unit for receiving said path metrics of said 2^{K-2} local winner states from said add-compare-select module and selecting a best state from among said 2^{K-2} local winner states every *L* iterations; and

a survivor memory comprising:

a register-exchange network for receiving said decision bits of said 2^{K-1} states from said add-compare-select module and generating decision vectors of survivor paths leading to said 2^{K-1} states at instant *i* according to said decision bits of said 2^{K-1} states from instant *i-L* to instant *i*, wherein said decision vectors of said 2^{K-1} states are output every *L* iterations and each of said decision vectors has a length of *L* bits; and

a trace-back unit for storing said decision vectors of said 2^{K-1} states and finding a global survivor path sequence by following said decision

vectors back from the best state at instant *i-L*, such that *L* decoded bits are output every *L* iterations.

8. (Original) The Viterbi decoder as recited in claim 7 wherein said best survivor unit comprises γ 2-to-1 comparators for choosing the best state among said 2^{K-2} local winner states by comparing said path metrics of said 2^{K-2} local winner states in *L*-1 iterations.

9. (Original) The Viterbi decoder as recited in claim 8 wherein the number of said 2-to-1 comparators, γ, is given by:

$$\gamma = \left\lceil \frac{2^{K-2}-1}{L-1} \right\rceil$$

where $\lceil \cdot \rceil$ denotes a ceiling function.

10. (Original) The Viterbi decoder as recited in claim 7 wherein said number of *L* is equal to a divisible factor of a data payload length for a conformant 802.11g system.

11. (Original) The Viterbi decoder as recited in claim 10 wherein said number of *L* is equal to 8 for said conformant 802.11g system.

12. (Original) The Viterbi decoder as recited in claim 7 wherein said survivor memory features a decoding window length of $\Gamma = L(L-2)+K-1$.

13. (Original) The Viterbi decoder as recited in claim 7 wherein said decision metrics are hard-decision data if quantized to one-bit precision.

14. (Original) The Viterbi decoder as recited in claim 7 wherein said decision metrics are soft-decision data if quantized with more than one bit of precision.